

Release properties on gelatin-gum Arabic microcapsules containing camphor oil with added polystyrene

梁庭繼

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摘要

Abstract

In this study, gelatin blended with arabic gum microcapsules containing camphor oil with added polystyrene were fabricated by a compound coacervation method. The parameters of oil/wall volume ratio, emulsification stirring speed, concentration of cross-linking agent, treated time and oil release properties were investigated. In order to improve the constant release effect of camphor oil, oil-soluble polystyrene (PS) was used as a sustained release agent. The camphor oil release curves were expressed by the exponential equation: $\phi(t) = C_{eq}(1 - e^{-t/\tau})$, where $\phi(t)$ represent the variant of camphor oil concentration in the operation environment, C_{eq} as the equilibrium state, t as the release time and τ as time constant. C_{eq} and τ are significant factors pertaining to the camphor oil release properties. The results indicated that, for the microcapsules, the optimal oil/wall volume ratio was 0.75 to achieve the encapsulation efficiency of 99.6 wt.%. The average particle size were $294.7 \pm 14.2 \mu m$, $167.2 \pm 11.2 \mu m$, $85.7 \pm 8.7 \mu m$ at the homogenization stirring speed of 500, 1000, and 2000 rpm, respectively. The effect of sustained oil release will increase whereas the stirring speed decreases and the concentration of glutaraldehyde (GA) and treated time increases. Along with the increasing of quantity of polystyrene added, C_{eq} decreased and τ increased, indicating that the sustained oil release amount and the release rate depend on the quantity of PS considerably.